PLAYING VIRTUAL HOUSE
First Annual Virtual Reality Conference
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By John Minkowsky

Over the past few years, rumors of "virtual reality" (VR) have begun to fire the public imagination. No longer the secret purview of military-industrial technologists, longhair computer hackers, and a small band of academic institutions, VR has been the subject of major articles in *The New York Times* and *The Wall Street Journal.* VR has also begun to penetrate the marketplace; it is a growth industry for the millennium. The Next Big Thing. The Wave of the Future. The ultimate interactive entertainment experience. Sort of a cross between the home video game, an elaborate theme park fantasy ride, and science fiction encounter therapy. You are there, sentient and mobile, in an artificial place, the product of the best that digital technology has yet to offer.

Such high profile, mass-market coverage has provided a common, if superficial, account of the VR experience. The central image is that of a "patron" of an alternative, computer-generated world, who dons an elaborate, hi-tech getup. This consists of a binocular (and binaural) headset whose two tiny TV screens emanate a synthetic 3D environment and whose sensitivity to all head movements includes "realistic" shifts in perspective, as well as electronic "data gloves" (or even a "data suit") that allow one to feel or move imaginary objects in virtual space and permit tactile interaction with other telepresences (human or electronically generated) that are simultaneously "jacked into" the system.

While prototypes for elaborate VR gear have been developed, most notably through the work of the NASA Ames Research Center, Jason Lanier's VPL (Virtual Programming Languages) Corporation, and the Cyberspace Project of Autodesk, Inc., such megabuck work toward experience simulation not only is still in its infancy but represents merely one manifestation (albeit the flashiest) of the burgeoning VR phenomenon. Some alternative definitions, as well as hard questions about the significance of VR, were among the topics touched upon at the First Annual Virtual Reality Conference convened in San Francisco last December by Meckler Corporation (which also publishes the quarterly *Virtual Reality*, edited by Sandra K. Heisel, and the book *Virtual Reality: theory, practice and promise*, edited by Heisel and Judith Paris Roth). Philosophers, information scientists, sociologists, architects, theoreticians of theater, education, and artificial intelligence, and designers representing young commercial firms and established academic institutions nationwide were invited to offer up their individual recipes for virtual representation. "Consensual" is a word that gets bandied about quite a bit in describing the multi-person creation of a virtual world, but an absence of clear consensus among the speakers in San Francisco, in their varied attempts to define the terminology, purposes, potentials, and tools of VR, was one of the conference's healthiest features.

> If you suddenly wanted to make the planet three times larger, put a crystal cave in the middle with a giant goat bladder pulsing inside of that and tiny cities populating the goat bladder's surface, and running between each of the cities were solid gold railways carrying tiny gerbils playing accordions – you could build that instead of talking about it!
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> - Jaron Lanier[1]

A key problem in discussing VR is that one finds oneself talking almost entirely about potential, rather than actual, applications. Moreover, the possibilities are so vast that each imagined application engenders others. Not only military and commercial uses but medical, educational, psychotherapeutic … the list goes on and on. And if we can conceive of activity in a VR funhouse as tactile and kinetic, can the notion of "teledildonics" be far behind?[2]

Michael Spring, assistant professor in the department of Information Sciences at the University of Pittsburgh, made the most extensive and cogent attempt at a broad definition of VR in his talk "Models for Human-Computer Interaction." Beginning with some basic assumptions – that VR must include both a computer and at least one human patron and the computer must be programmed to assert some measure of control as a true participant – he then distinguished between terms often used interchangeably: "virtual reality" (that which gives the essence or effect of fact without being fact), "artificial reality" (an analogue to nature as constructed by humans), "alternate reality" (a substitute, conceivably independent of natural physical laws), and "cyberspace" (a metaplace where human nervous systems and electromechanical computational systems are linked – the habitat, as it were, for any of the "realities" listed above. Subtle (or vague) as these distinctions might seem, Spring's provisional glossary represents a first systematic step out of hermetic tech-speak. More specific types of the oxymoronic VR can be identified on the basis of intention (from sheer data management to architectural simulation to entertainment), of the type of input information out of which a VR is constructed (imaginary/synthetic or real world/scientific), and of the character of the mind/machine interface itself (as computer keyboards and mice give way to multisensory goggles and gloves).

The first day of the conference was devoted to theoretical discussion of VR, both celebratory and circumspect. Conference keynote speaker Myron Krueger, an artist and engineer, raised such issues as the impact of replacing sedentary, sensory-deprived modes of learning with kinetic and dynamic ones and the ethical implications of (re)integrating thought and action in contemporary society. Krueger, who coined the term "artificial reality," was among the first to recognize, more than 20 years ago, the importance of a computer interface that is responsive to the movement of the entire human body.

Krueger's presentation, "Shaping Cultural Consciousness with Artificial Reality," served mainly as a retrospective of his various computer driven video installations of the past decade. Of these, his best-known is a series called "Videoplace" in which participants, their images captured live, can interact via computer control with other remote players,

synthetic backgrounds, or electronically generated "critters" on the common space of a large 2D video projection screen. Though Krueger looked to a future when "Videoplace" would incorporate lightweight headmounts to merge 3D graphics with video perception, his visionary work sadly seemed, in format and by today's technological standards, more like an ambitious video installation of the 1970s – a bit naïve and dated aesthetically. Despite his claims to the contrary, the displacement of self as a projected image from the actual sense of one's corporeal presence is quite different from the feeling of "being there," in the midst of an alternate world, toward which VR strives.

Hybrid or mixed-media forms not normally associated with the exoticism of VR were also represented by Joseph Henderson, director of the Laboratory of Multimedia at Dartmouth College Medical School, in "Is There More to Virtual Reality than We Sense?" Henderson is an educator who finds the narrative tradition underemployed in VR research but of enormous import in communicating learning experiences that are transferable to "everyday, non-virtual reality." He has designed two multimedia training programs for the U.S. Military that link conventional CRT displays to digital hardware and software to create a complex interactive mix of live sequences on film, direct and ambient sound, computer graphics, and text. In one, called *Regimental Surgeon*, "the user can enter, explore, discover facts and formulate rules and principles much as an individual would in real life."[3] The camera represents the point of view of the participant-as-new-staff-officer who must identify an undisclosed medical threat (malaria) by accessing and interpreting fragmentary information provided by eight characters as well as data of other types (medical records, blood samples, etc.).

Its sheer complexity, professional production values, and adventure game format place *Regimental Surgeon* among the most engaging and well-designed interactive training programs yet devised. At times it seemed to represent an almost too manageable definition of VR; a countermeasure, perhaps to the otherworldly visions of cyberspaced sensorium expanders. Henderson feels that VR need not engage the entire physical body via specialized clothing. Retrograde as this may sound, it is a point well taken: circumscribed routes toward full full-fledged VT such as this one may well offer present users their most immediately rewarding experiences and the VT field a model for and anchor in practical applications.

Other speakers that day were more concerned with the philosophical and theological issues implicit in the creation of and participation alternate worlds. Nicole/Natalie Stenger (Natalie is her cyberspace name), a research fellow at MIT's Center for Advanced Visual Studies, offered a talk entitled "Cyberspace: A Soufflé Forever Called Home." After a belabored, but often witty, comparison of cyberspace to the aforementioned French delicacy (both are victims of fashion, highly unstable, elastic, and erotic), Stenger's presentation grew more academic, poetic and vague. She characterized the "we" that enter cyberspace as hybrid mutations – part creatures of "solid light," or souls, or angels (citing Mircea Eliade's notion of sacred space and time) and part what she termed "post-babies," referring perhaps to the immediate gratification afforded by VR or to the Baudrillarian notion that with telepresence – the projection of one's own

judgment into a "robot" located at a real but undesirable place – one will go nowhere because everything will come to one.

In his talk on "The Metaphysics of Virtual Reality," Michael Heim of the philosophy department at California State at Long Beach defined virtual space as space that, while nonmaterial, operates as though it were real. Heim proposed that in engaging in the pluriverse VR will serve to amplify, we may come to require and rely upon solid, universal "reality anchors" – our senses of mortality, of personal history, and of human fragility – as reality checks against which to measure and set limits for meaningful experience in virtual environments.

Brenda Laurel, a partner in Telepresence Research and author of the forthcoming book *Computers as Theatre*, offered some intriguing ideas regarding the design of cyberspace in "A Dramatic Theory of Virtual Reality." Laurel has written of the controversy in the VR field surrounding the extent to which a virtual world and the free range of experience afforded its users should be designed and prepackaged.[4] She suggested that, as with theater, filling the bare stage with electronic props, backdrops, and characters would stimulate users in their virtual role-playing and enrich their experience of cyberspace. Laurel lobbied for heightened attentiveness to the structuring of dramatic time in VR and to the need to minimize the perception of technology once the user has entered an alternate world.

A number of participants were concerned in addressing the gender and racial biases in the field of VR and its domination by corporate applications early on – before the system gets hard-wired. "She Was Asking For It: Sex and Death in the Virtual Jungle" was presented by Allacquere Rosanne Stone of the University of California at Santa Cruz and San Diego. Stone observed, on the one hand, the infiltration of gender bias into popular forms (e.g., the female warrior motif in video games), and, on the other, the potential for gender- and culture-switching in VR. If VR is to give rise to a model of pancultural interaction, questions such as Stone's must be addressed: "How do we speak to as many audiences as possible?", "Who builds cyberspace communities and who gets in?" and "Who gets to say what who means?"

The second day of the conference, dedicated to current and projected VR practice, revealed the gap between VR as a revolutionary concept and the actual development of technology for VR's widespread implementation. "Compromise" was an operative term: several designers spoke of sacrificing image resolution for real-time interactivity, and there was a pervasive sense that the most radical visions of new VR worlds, art forms, ways of play, and methods of communication were to be deferred, perhaps for decades, for more immediately profitable corporate uses. There was also a hint of absurdity in the fact that amid so much talk of conferencing in VR we were nonetheless all sitting there, some 300 strong, in a crowded, slightly overheated room in our decidedly non-virtual bodies, having traveled hundreds, if not thousands, of miles to participate. However, "Practice and Promise" did offer its share of useful perspectives on VR and reaffirmed the resourcefulness of those committed to the "soufflé" of cyberspace.

Randal Walser, manager of the Cyberspace Project at Autodesk, Inc., is one of the most lucid and convincing spokespersons for cybernetic simulations in which a "patron" may control a "puppet" as his/her virtual counterpart via tight feedback loops of sensors and effectors. Walser's schematic configuration of potential modular cyberspace "decks," in which individuals can jack into shared, multi-person VRs, were illuminating. That such decks remain largely unrealized does not refute Walser's contention that the technology used to create cybernetic simulations has been around since the 1960s; what is new is the paradigm that redefines the relation between human and computer. The idea that computers were simply tools for the disembodied intellect of the mind has given way to one in which "computers are seen as engines for new worlds of experience, and the body is regarded as inseparable from the mind."[5]

Like Laurel, Walser envisions multi-person cyberspace as theater in the broadest sense, in which the VR artist, as "spacemaker," summons up an array of virtual objects and links them to multi-body sensor systems. Yet at one point Walser said, "The cyberspace biz is the magic biz," underlining the commercial/entertainment bias of his interests. In his article "Elements of a Cyberspace Playhouse" Walser dwells on a description of an electronic 21st century health club where one may rent time on bicycles and rowing machines coupled sensorially to virtual lanes and lakes. That commerce will precede and expedite the implementation of more democratized VRs comes as no shock. Consider the top-down dissemination of computer graphics systems – from military to business to entertainment to art.

Eric Gullichsen, president of the year-old Sense8 corporation, spoke about "Bringing Affordable Virtual Reality Systems to Market." His talk, which was more in the way of a company promo, denounced the present costliness of and hype surrounding goggle-and-glove-based systems and promoted Sense8's own desktop (or portable) VR, created for 2D display on systems priced at $9000 or less. Given their relative economy, Sense8's graphics of navigable landscapes, while somewhat primitive, were impressive. Gullichsen's further contention that the interactive, non-linear structure of virtual worlds is the basis of a new narrativity raises the question: Will there need to be more of an awareness of narrative structure in a full-blown VR experience than we currently have in our experience of everyday material existence?

The final presenters addressed the needs of education and business with some urgency and not a little fanciful prognostication. Tom Barrett of Electronic Data Systems represented the corporate viewpoint and some of the dilemmas presently facing knowledge workers, while David Traub, an expert in instructional software design, considered the pedagogical applications of VR. Barrett's talk, "Cooperative Work Environments," began with an extended fiction about two industrial designers, continents apart, evolving very specific methods of complex interaction using "puppets" as their collaborative proxies in a shared virtual environment. Virtual collaboration of such a high order is, of course, not yet possible; in the meantime, Barrett seemed most concerned with how to manage massive volumes of data and noted that, at the present high rate of technological change in our society, people are going to have to learn the equivalent of a college education every 10 years. Barrett saw a solution in the development of a "virtual

reality synergism" out of current research in "human intellect augmentation" (related to artificial intelligence), together with the development of collaborative strategies and technologies.

Traub, in "Educational Implications for Virtual Reality," acknowledged that the first widespread manifestations of VR will be for entertainment purposes and took the position that entertainment and education, far from being mutually exclusive, develop and draw upon the same learning skills: intellectual proficiency (speech and symbols), cognitive strategies (problem solving), verbal information (memory storage), and motor abilities. He noted potential problems in adopting VR as an instructional tool: it might become a panacea or be too readily and passively accepted; and first-person "truth-rendering" will raise familiar questions of ethics and perspective. If a child becomes a participant in a simulated Civil War battle, as Traub proposes in his "history room" model, whose side will she be fighting on, what belief structure will that imply, and how will she know it?

It is clear that something called virtual/artificial/alternate reality – some new model for human and computer interaction and some new class of experience – exists in prototypical form. It is also fairly certain that the phenomenon of VR will continue to grow, possibly at breakneck speed. But whom will it benefit, in what ways will it enrich, and how can it avoid the pitfalls of becoming yet another technology for mass manipulation by incumbent powers? The First Annual Virtual Reality Conference was a forum for an examination of these issues at a time when so little about the future of VR has been decided and locked into place.[6]

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[1] Jaron Lanier, quoted in Doug Stewart, "Interview with Jaron Lanier," *Omni* 13, no. 4 (Jan. 1991), p. 46

[2] See Howard Rheingold, "Teledildonics: Reach Out and Touch Someone," *Mondo 2000*, Summer 1990, pp. 52-54.

[3] Joseph Henderson, "Designing Realities: Interactive Media, Virtual Realities, and Cyberspace," in *Virtual Reality: Theory, Practice and Promise*, ed. Sandra K. Heisler and Judith Paris Roth (Westport, CT: Meckler, 1991), p. 67.

[4] Brenda Laurel, "Virtual Reality Design: A Personal View," in ibid, pp. 95-98.

[5] Randal Walser, "Elements of a Cyberspace Playhouse," in ibid., p. 53.

[6] Meckler is planning the second annual Virtual Reality Conference for September 30-October 1, 1991, in San Francisco.

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